IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application No. 10/520,080

Applicant: Abdoulaye DOUCOURE et al.

Filed: January 5, 2005

TC/AU: 1797

Examiner: Krishnan S. Menon

Docket No.: 440993

Customer No.: 23548

Commissioner for Patents
U.S. Patent and Trademark Office
Randolph Building
401 Dulany Street
Alexandria, VA 22314

DECLARATION UNDER 37 CFR §1.132 OF ABDOULAYE DOUCOURÉ, PH.D.

Dear Sir:

I, Abdoulaye Doucouré, hereby declare that:

1. I am presently employed by Pall Corporation, East Hills, NY, as a Senior Principal Research and Development Scientist. I have been employed by Pall Corporation since 1998, starting as a Project Manager in the Research and Development Department, and subsequently occupying several positions within the membrane research groups at Pall Corporation, including head of Pall Life Sciences New Media Technology. Including my doctoral and post-doctoral studies, I have over 15 years of experience in the areas of membrane and thin film technology.

2. I received a Ph.D. from the University of Montpellier II in Materials Chemistry from the Laboratory of Materials and Membranes (currently, the Institut Europeen des Membranes) in 1995. I received a Diplome d'Etudes Approfondies (M.S.), Concentration, Polymers,

Interface and Amorphous States, from the University of Montpellier II in 1991, and a Maitrise de Chimie (B.S.) in Chemistry from the University of Montpellier II in 1990.

3. I conducted post-doctoral research at ELF ATOCHEM North America from 1996 to 1997 particularly with respect to preparation of fluoropolymers and polymer blends for paints and architectural coatings.

4. I am a Co-founder of the Mali Symposium on Applied Sciences, and I have authored, or co-authored, several publications relating to membrane technology. I have given numerous presentations relating to membrane and coating technology and characterization.

5. I am one of the inventors listed in U.S. Patent Application entitled "UV Treated Membranes," that I understand was given application number 10/520,080. I will refer to this U.S. Patent Application as "the Application" below.

6. I have reviewed the Application, as well as claims 1 and 6 that I understand are pending in the Application, and I have also reviewed U.S. Patents 6,117,497 to Murahara et al. ("Murahara") and 4,946,903 to Gardella, Jr. et al. ("Gardella") referred to in Office Action mailed in the Application on May 5, 2009.

7. At my direction, microporous PTFE membranes were prepared following the teachings of Murahara.

8. Membranes prepared as described in paragraph 7 above (referred to below as the "UV treated" prepared membranes) were analyzed, with the results listed in the following table, which also includes the values listed in Murahara Examples 49 and 52.

	F/C ratio	O/C ratio	CWST (dynes/cm)
UV treated prepared membrane 1	0.63	0.2	72 (spotty)
UV treated prepared membrane 2	0.64	0.18	72
UV treated prepared membrane 3	0.66	0.13	72
Murahara ex 49	.28	.18	Not listed
Murahara ex 52	.28	.18	Not listed

9. At my direction, a microporous PTFE membrane was prepared following the teachings of Gardella.

10. The membrane prepared as described in paragraph 9 above (referred to below as the "RF treated" prepared membrane) was analyzed, with the results listed in the following table, which also includes the values listed in Gardella Examples I and II.

	F/C ratio	O/C ratio	CWST (dynes/cm)
RF treated prepared membrane	0.5	0.1	23
Gardella ex I	.67	.14	Not listed
Gardella ex II	1.1	.11	Not listed

11. At my direction, microporous PTFE membranes treated as described in paragraph 7 above were subsequently treated as described in paragraph 9, and analyzed, with the following results:

	F/C ratio	O/C ratio	CWST (dynes/cm)	Zeta potential (mV)
UV treated/RF treated prepared membrane 1	0.71	0.06	33	+16 pH 4; -7 pH 5; -31 pH 7; -39 pH 8.8
UV treated/RF treated prepared membrane 2	0.74	0.09	33 (spotty)	+15 pH 4; -7 pH 5; -39 pH 7; -43 pH 8.8

12. At my direction, microporous PTFE membranes were treated as described in paragraph 9 above were subsequently treated as described in paragraph 7, and analyzed, with the following results:

	F/C ratio	O/C ratio	CWST (dynes/cm)	Zeta potential (mV)
RF treated/UV treated prepared membrane 1	0.27	0.18	72 (spotty)	+2 pH 4; -1 pH 5; -8 pH 7; -16 pH 8.8
RF treated/UV treated prepared membrane 2	0.41	0.14	43	+11 pH 4; -6 pH 5; -17 pH 7; -39 pH 8.8

13. None of the membranes prepared and analyzed as described in paragraphs 11 and 12 above had, in combination, a CWST of at least about 40 dynes/cm through the thickness and bulk of the membrane, a wetting/dewetting ratio of at least about .7 for two or more cycles, and first and second surfaces each having an F/C ratio of about 1.2 or more and an O/C ratio in the range of from about 0.01 to about 0.15 (claim 1), or, in combination, a CWST of at least 26 dynes/cm (.26 erg/mm^2) through the thickness and bulk of the microporous PTFE membrane, and a wetting/dewetting ratio of at least about .7 for 2 or more cycles, wherein the microporous PTFE membrane is free of a coating and wherein the first and second surfaces each have a fluorine/carbon (F/C) ratio of about 1.2 or more and an oxygen/carbon (O/C) ratio in the range of from about 0.01 to about 0.15 (claim 6).

14. Based upon my knowledge and experience, PTFE membranes having F/C ratios as referenced in paragraphs 11 and 12 above will exhibit reduced tensile strength and elastic modulus and will not provide consistent results in an industrial setting. Furthermore, also based upon my knowledge and experience, PTFE membranes having such F/C ratios would be expected to lose their chemical and thermal stability when exposed to challenging liquids such as corrosive liquids and high temperature liquids, in contrast with PTFE membranes described in the Application.

15. With respect to zeta potential, it is known that the zeta potential of a membrane characterizes the distribution of ions located at the interface between the membrane and the aqueous solution (in motion) in which the membrane is submerged. The zeta potential reflects the electrostatic charge measured in close vicinity of the membrane.

16. None of the membranes prepared and analyzed as described in paragraphs 11 and 12 above had a zeta potential in the range of from about -3 mV to about – 11 mV at a pH in the range of from about 4 to about 9.

17. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further than these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

7/28/2009
Date

Abdoulaye Doucouré, Ph.D.